ABSTRACT

The imager system of the invention, provided in a semiconductor substrate, includes a plurality of photosensitive, charge integrating pixels that are arranged in rows and columns of a pixel array for capturing illumination of a scene to be imaged. Each pixel includes a photogenerated charge accumulation region of the semiconductor substrate and a sense node at which an electrical signal, indicative of pixel charge accumulation, can be measured without discharging the accumulation region. Pixel access control circuitry is connected to pixel array rows and columns to deliver pixel access signals generated by the access control circuitry for independently accessing a selected pixel in the array. An input interface circuit is connected to accept a dynamic range specification input for the array pixels. Integration control circuitry is connected to access a selected pixel of the array to read the sense node electrical signal of the selected pixel, and configured to generate pixel-specific integration control signals delivered to the selected pixel, independent of other pixels, based on dynamic range specification input provided by the input interface circuit. An output interface circuit is connected to the pixel array to produce output image data based on sense node electrical signals from the pixel array.